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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,021	03/23/2004	Ryan Lei	P18705	5697

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EXAMINER	
MENZ, DOUGLAS M	

ART UNIT	PAPER NUMBER
2891	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/808,021	LEI ET AL.	
	Examiner	Art Unit	
	Douglas M. Menz	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *7-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Search History*.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-6, in the reply filed on 6/13/05 is acknowledged.

Specification

The abstract of the disclosure is objected to because of the use of the implied language "The invention provides...". Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Lochtefeld et al. (US PGPUB 2004/0115916).

Regarding claim 1, Lochtefeld discloses a method comprising:

Depositing a graded silicon germanium layer on a substrate (paragraph 50 and Fig. 1);

Depositing a relaxed silicon germanium layer on the graded silicon germanium layer (paragraph 50 and Fig. 1);

Polishing the relaxed silicon germanium layer (paragraph 55); and

Depositing a strained silicon layer (102) directly on the polished relaxed silicon germanium layer (paragraph 52 and Fig. 1).

Regarding claim 2, Lochtefeld further discloses wherein the strained silicon layer (102) has a first surface adjacent the polished relaxed silicon germanium layer and a second surface substantially opposite the first surface and the second surface has a roughness of about 1.0 nanometers RMS or less (paragraph 55 and Fig. 1).

Regarding claim 3, Lochtefeld further discloses wherein the strained silicon layer (102) has a first surface adjacent the polished relaxed silicon germanium layer and a

second surface substantially opposite the first surface and the second surface has a roughness of about 0.5 nanometers RMS or less (paragraph 55 and Fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lochtefeld et al. (US PGPUB 2004/0115916) in view of Sawano et al. (Japanese Patent Application Publication 2002-289533).

Regarding claims 4 and 6, Lochtefeld discloses the method of claim 1 as mentioned above, and further discloses that the strained silicon layer (102, Fig. 1) has a

thickness in a range from about 150 angstroms to about 1000 angstroms (paragraph 52). Although Lochtefeld discloses chemical mechanical polishing of the relaxed layer, Lochtefeld does not explicitly disclose that the polishing step lasts for at least 60 seconds.

Sawano discloses a method of forming a strained silicon layer (30) on top of a relaxed SiGe layer (20, *top half*) which is on a graded SiGe layer (20, *bottom half*) on a Si substrate, wherein the relaxed layer is chemical mechanically polished (CMP) for up to 10 minutes (Abstract and Figs. 1a-e and Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to polish the relaxed layer of Lochtefeld's structure for at least 60 seconds as taught by Sawano for the purpose of reducing the roughness of the relaxed layer (see Sawano, Fig. 3).

Regarding claim 5, Lochtefeld discloses the method of claim 1 as mentioned above. However, Lochtefeld does not disclose wherein the relaxed layer is deposited to a thickness of about 2000 to 5000 angstroms and then the polishing removes about half of this layer.

Sawano discloses that the deposited layer of SiGe is 5000 angstroms or more and that after polishing, the preferred thickness is in the range of 1000 angstroms to 5000 angstroms. Therefore, about half of the layer was removed by the polishing process (see English translation paragraphs 23-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to polish the relaxed layer of Lochtefeld's structure in accordance to the teachings of Sawano for the purpose of reducing the roughness of the relaxed layer as taught by Sawano (see English translation paragraphs 23-25 and Fig. 3).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US patent 6649492 discloses a strained Si based structure and method pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas M. Menz whose telephone number is 571-272-1877. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM 8/19/05